

From the INTERNATIONAL SEARCHING AUTHORITY

**PCT**

To:

DORSEY & WHITNEY LLP  
Attn. Abelev, Gary ESQ.  
250 Park Avenue  
New York, NY 10177  
ETATS-UNIS D'AMERIQUE

Patent Mail Received

JUN 13 2009

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL SEARCH REPORT AND  
THE WRITTEN OPINION OF THE INTERNATIONAL  
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference 189558/PCT		Date of mailing (day/month/year) 10/06/2009
International application No. PCT/US2008/075456		International filing date (day/month/year) 05/09/2008
Applicant  THE GENERAL HOSPITAL CORPORATION		

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

**Filing of amendments and statement under Article 19:**

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

**When?** The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.

**Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes  
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70

**For more detailed instructions,** see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.
3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
- ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

**4. Reminders**


Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the International Searching Authority  European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  Sibylle Schubert-Püschel
--	--

## NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

### INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report and the written opinion of the International Searching Authority, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only (see *PCT Applicant's Guide*, Volume I/A, Annexes B1 and B2).

The attention of the applicant is drawn to the fact that amendments to the claims under Article 19 are not allowed where the International Searching Authority has declared, under Article 17(2), that no international search report would be established (see *PCT Applicant's Guide*, Volume I/A, paragraph 296).

#### What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

#### When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

#### Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

#### How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Section 205(b)).

**The amendments must be made in the language in which the international application is to be published.**

#### What documents must/may accompany the amendments?

##### Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

**The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.**

## NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

**The following examples illustrate the manner in which amendments must be explained in the accompanying letter:**

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:  
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:  
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:  
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or  
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:  
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

### **"Statement under article 19(1)" (Rule 46.4)**

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

**It must be in the language in which the international application is to be published.**

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

### **Consequence if a demand for international preliminary examination has already been filed**

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

If a demand for international preliminary examination is made, the written opinion of the International Searching Authority will, except in certain cases where the International Preliminary Examining Authority did not act as International Searching Authority and where it has notified the International Bureau under Rule 66.1bis(b), be considered to be a written opinion of the International Preliminary Examining Authority. If a demand is made, the applicant may submit to the International Preliminary Examining Authority a reply to the written opinion together, where appropriate, with amendments before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later (Rule 43bis.1(c)).

### **Consequence with regard to translation of the international application for entry into the national phase**

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see the *PCT Applicant's Guide*, Volume II.

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 189558/PCT	<b>FOR FURTHER ACTION</b> see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2008/075456	International filing date (day/month/year) 05/09/2008	(Earliest) Priority Date (day/month/year) 05/09/2007
Applicant  THE GENERAL HOSPITAL CORPORATION		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 7 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed  
☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☒ **Unity of invention is lacking** (see Box No. III)

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant  
☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☐ the text is approved as submitted by the applicant  
☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 1  
☒ as suggested by the applicant  
☐ as selected by this Authority, because the applicant failed to suggest a figure  
☐ as selected by this Authority, because this figure better characterizes the invention  
 b. ☐ none of the figures is to be published with the abstract

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2008/075456

## Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

An apparatus and the corresponding method, representing a common-path interferometer, whereby the sample and reference beams have different diameters. These first and second beams first travel separated paths in order to change their diameter. After being reunited on a common path, a first partial reflector is used to generate a first interferogram carrying information about fluctuations in the separated paths. The transmitted beams are directed onto the sample, respectively reference reflecting flat in close proximity to the sample, on a common path. The spectral interferogram recorded as the interference of these third and fourth beams is used to determine information relating to the sample.

**A. CLASSIFICATION OF SUBJECT MATTER**  
INV. G01B9/02

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**Minimum documentation searched (classification system followed by classification symbols)  
G01B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 5 555 087 A (MIYAGAWA ICHIROU [JP] ET AL) 10 September 1996 (1996-09-10) column 8 - column 12; figures 1,2	1-3,5-7, 9 8
X Y	GB 2 298 054 A (NIKON PRECISION INC [US]) 21 August 1996 (1996-08-21) page 1 - page 5; figures 1,2	1,4,9  8
X Y	US 2005/057756 A1 (FANG-YEN CHRISTOPHER M [US] ET AL) 17 March 2005 (2005-03-17) paragraph [0212] - paragraph [0228]; figures 19,34	1-3,5-7, 9  8
	----- -/--	

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

## \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*&\* document member of the same patent family

Date of the actual completion of the international search

20 February 2009

Date of mailing of the international search report

10/06/2009

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040,  
Fax: (+31-70) 340-3016

Authorized officer

Stanciu, C

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>WO 2006/124860 A (GEN HOSPITAL CORP [US]; JOO CHULMIN [US]; DE BOER JOHANNES F [US]) 23 November 2006 (2006-11-23) page 7 - page 11; figures 1-6 abstract</p> <p style="text-align: center;">-----</p>	<p>1-3, 5-7, 9</p>

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2008/075456

## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.
  
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
  
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search reportcovers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

see annex

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.



**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-9

An apparatus and the corresponding method, representing an interferometer adapted to produce and receive first interferogram to generate signal about fluctuations in the separated paths of two partial beams and to produce and receive second interferogram to determine information regarding spectrally resolved interference of other two partial beams relating to the sample.

----

2. claims: 10-35

Computer-accessible media with instructions to process data corresponding to interference between a sample and a reference into data carrying information on directional displacement and diffusion properties of the sample.

----

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 5555087	A	10-09-1996	JP	3234353 B2	04-12-2001
			JP	7005100 A	10-01-1995
GB 2298054	A	21-08-1996	DE	19601692 A1	22-08-1996
			JP	8240792 A	17-09-1996
			US	5648848 A	15-07-1997
US 2005057756	A1	17-03-2005	NONE		
WO 2006124860	A	23-11-2006	EP	1886121 A1	13-02-2008
			JP	2008541096 T	20-11-2008

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCTUS2008/075456

International filing date (day/month/year)  
05.09.2008

Priority date (day/month/year)  
05.09.2007

International Patent Classification (IPC) or both national classification and IPC  
INV. G01B9/02

Applicant  
THE GENERAL HOSPITAL CORPORATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0  
Fax: +49 89 2399 - 4465

Date of completion of  
this opinion

see form  
PCT/ISA/210

Authorized Officer

Stanciu, C

Telephone No. +49 89 2399-5940



---

**Box No. I Basis of the opinion**

---

1. With regard to the **language**, this opinion has been established on the basis of:
  - ☒ the international application in the language in which it was filed
  - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ on paper
    - ☐ in electronic form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in electronic form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

---

**Box No. II Priority**

---

1. ☒ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43bis.1 and 64.1) is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

☐ the entire international application

☒ claims Nos. 10-35

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international search (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed (*specify*):

☒ no international search report has been established for the whole application or for said claims Nos. 10-35

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

☐ furnish a sequence listing on paper complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in a form and manner acceptable to it.

☐ furnish a sequence listing in electronic form complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in a form and manner acceptable to it.

☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rules 13*ter*.1(a) or (b).

☐ a meaningful opinion could not be formed without the tables related to the sequence listings; the applicant did not, within the prescribed time limit, furnish such tables in electronic form complying with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions, and such tables were not available to the International Searching Authority in a form and manner acceptable to it.

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in electronic form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☒ See Supplemental Box for further details

---

**Box No. IV Lack of unity of invention**

---

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has, within the applicable time limit:
- ☐ paid additional fees
  - ☐ paid additional fees under protest and, where applicable, the protest fee
  - ☐ paid additional fees under protest but the applicable protest fee was not paid
  - ☒ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
  - ☒ not complied with for the following reasons:  
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
  - ☒ the parts relating to claims Nos. 1-9

---

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

---

1. Statement

Novelty (N)	Yes: Claims	<u>7,8</u>
	No: Claims	<u>1,2,3,4,5,6,9</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-9</u>
Industrial applicability (IA)	Yes: Claims	<u>1-9</u>
	No: Claims	

2. Citations and explanations

see separate sheet

---

**Box No. VII Certain defects in the international application**

---

The following defects in the form or contents of the international application have been noted:

see separate sheet

---

**Box No. VIII Certain observations on the international application**

---

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**Re Item III - Non-establishment of opinion**

- 1 No opinion has been established for Claims 10-35 because of lack of unity of invention (see Item IV).

**Re Item IV - Lack of unity of invention**

- 2 This International Searching Authority found multiple groups of inventions covered by the claims, indicated as follows:

- I. Claims 1-9: An apparatus and the corresponding method, representing an interferometer adapted to produce and receive first interferogram to generate signal about fluctuations in the separated paths of two partial beams and to produce and receive second interferogram to determine information regarding spectrally resolved interference of other two partial beams relating to the sample.
- II. Claims 10-35: Computer-accessible media with instructions to process data corresponding to interference between a sample and a reference into data carrying information on directional displacement and diffusion properties of the sample.

- 2.1 The only technical feature common to all independent Claims 1, 9, 10, 19, 28 and 32 is the determination of information regarding a sample from an interferogram. This is, however, the overall purpose of an interferometer and with this the last step in the use of any interferometer.
- 2.2 Examining the possible correspondence by technical effect, one finds that the technical effect of the first invention is eliminating the influence of fluctuations in the uncommon paths of reference and sample arms from the interferogram carrying information relevant to the sample, while the technical effect of the second invention is processing the data corresponding to an interferogram in



order to gain information about directional displacement and diffusion properties of the sample. The two inventions obviously do not have a corresponding technical effect.

- 2.3 Therefore, the two groups of claims are linked neither by common or corresponding special technical features, nor by common corresponding technical effects and define three different inventions not linked by a single general inventive concept.

The application hence does not meet the requirements of Unity of Invention as defined in Rules 13.1, 13.2 PCT. Accordingly, the partial search report has been drafted for the first invention (Claims 1-9).

### **Re Item V**

#### **First Invention**

- 3 Reference is made to the following documents:

- D1: US-A-5 555 087 (MIYAGAWA ICHIROU [JP] ET AL) 10 September 1996 (1996-09-10)  
D2: GB-A-2 298 054 (NIKON PRECISION INC [US]) 21 August 1996 (1996-08-21)  
D3: US 2005/057756 A1 (FANG-YEN CHRISTOPHER M [US] ET AL) 17 March 2005 (2005-03-17)  
D4: WO 2006/124860 A (GEN HOSPITAL CORP [US]; JOO CHULMIN [US]; DE BOER JOHANNES F [US]) 23 November 2006 (2006-11-23)

#### **Novelty**

- 4 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of Claims 1 and 9 is not novel in the sense of Article 33(2) PCT.

#### **Independent Claim 1**

- 4.1 Both documents D1 and D2 describe (see in particular D1: Figs. 1, 2 and columns

8-12 / D2: Figs. 1,2 and pages 1-5):

- a) An apparatus configured to propagate at least one electro-magnetic radiation (D1: interferometer of Fig. 19 / D2: interferometer of Fig. 1), comprising:
- b) at least one first arrangement configured to receive a first portion of the at least one electro-magnetic radiation directed to a sample and a second portion of the least one electro-magnetic radiation directed to a reference (D1: beams a1 and a2 / D2: beams 66 and 64), the at least one first arrangement being structured to at least partially reflect and at least partially allow to transmit the first and second portions (D1: beam splitter 42 / D2: beam splitter 32); and
- c) at least one second arrangement (D1: references 30, 31, 34, 35 and 38, column 9, lines 10-35 / D2: references 28B and 98, page 3, lines 4-13 and page 5, lines 8-12) configured to receive a third portion of the at least one electro-magnetic radiation associated with at least one of the transmitted first portion or the reflected first portion from the sample (D1: beam a4, column 10, lines 19-27 / D2: beam 40B, page 2, line 26 to page 3, line 13) and a fourth portion of the least one electro-magnetic radiation associated with at least one of the second transmitted portion of the least one electro-magnetic radiation or the reflected second portion from the reference (D1: beam a6, column 10, lines 33-43 / D2: beam 42B, page 2, line 26 to page 3, line 13), wherein the third and fourth portions travel at least partially along substantially the same path toward the at least one second arrangement (D1: beam a7 / D2: path 46B), wherein the at least one second arrangement is further configured to at least one of:
  - i. receive the at least one of the reflected first and second portions which interfere with one another, and generate at least one signal which includes information associated with at least one fluctuation in an uncommon path of the first and second portions prior to a receipt thereof by the at least one first arrangement (D2: part 98 of the second arrangement, see page 5, lines 8-12), or
  - ii. determine information regarding a spectrally resolved interference

associated with the third and fourth portions (D1: column 11, lines 9-40).

The subject matter of Claim 1 is therefore not novel.

Independent Claim 9

4.2 Claim 9 defines a method adapted to operate the apparatus of Claim 1. The objections raised for this latter claim, therefore, apply correspondingly to independent Claim 9.

4.3 The subject matter of Claims 1 and 9 is also not novel over the description of documents D3 (see Fig. 19, paragraphs 212-228) and D4 (see Abstract, Figs. 1-6 and pages 7-9)

Dependent Claims

4.4 Dependent Claims 2, 3, 4, 5 and 6 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of Article 33(1) and (2) PCT in respect of novelty.

Claim 2: light source 20 of document D1 is an SLD (column 8, line 32).

Claim 3: see the Abstract of document D4.

Claims 4 and 5: see the argumentation at point 4.1 as well as the conciseness objection at point 7.3.

Claim 6: a lens as reference 43 in document D1 can change the angle of incidence of electromagnetic radiation on the sample.

Inventive step

5 Dependent Claims 7 and 8 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of Article 33(1) and (3) PCT in respect of inventive step.

- Claim 7: The choice of a certain waist dimension in the sample is common options in the field of microscopy and as such do not add anything inventive to the subject matter of the respective claims; see also the objection at point 7.5.
- Claim 8: Any of the documents D1 and D3 can be regarded as closest prior art; both documents describe systems with first and second arrangements adapted to determine information regarding the spectrally resolved interference associated with the third and fourth portions (see also points 4.1 and 4.3). However, in both systems, the distance between the reference mirror and the sample is bound to larger than the coherence length of the source, as to avoid interference between first and second parts of the beam (see D1: column 10, lines 1-11 / D3: paragraph 217). Furthermore, document D3 acknowledges the problem of phase noise introduced in the uncommon path of the first and second radiation parts (paragraph 228). Confronted with these problems, the person skilled in the art would search for a solution to the problem of resolving the influence of phase noise introduced in the uncommon path of the first and second radiation parts onto the spectral interferogram of the third and fourth radiation parts, when the distance between the reference mirror and the sample is not limited to be higher than the coherence length of the source. Document D2, also confronted with this problem, presents as solution the detection of the superposition of the first and second beam parts to account for any fluctuations in their uncommon path (lines 4-12 on page 5). The solution of the present application does therefore not involve an inventive step.

## **Re Item VII**

- 6.1 Contrary to the requirements of Rule 11.13(a) and (b) PCT, Figures 7A and 7B have colour fillings that impede the clear reading of the leading lines in a black-and-white reproduction.

- 6.2 Contrary to Rule 6.2 (b) PCT, the claims do not contain reference signs that would facilitate easier understanding of the claimed subject matter.

### **Re Item VIII**

#### **Clarity and conciseness**

- 7 The application does not meet the requirements of Article 6 PCT, because Claims 1, 4, 5, 7, 8 and 9 are not clear and/or not concise.
- 7.1 The formulation "receive the at least one of the reflected first and second portions which interfere with one another" in Claims 1, 8 and 9 is not clear: "at least one of" implies that either the first or the second portions are received, meaning that they could not possibly interfere with each other.
- 7.2 Claim 9 recites a "Method of propagating [...] electro-magnetic radiation". Propagation is, however, an intrinsic property of the electromagnetic radiation. Mankind cannot *propagate* light, but only influence its propagation.
- 7.3 Both features of dependent Claims 4 and 5 are already defined in independent Claim 1, at points i., respectively ii. Claims 4 and 5 are thus an undue repetition of words, leading to lack of conciseness (Article 6 and Rule 6.1(a) PCT).
- 7.4 The formulation "generate the at least one signal prior to the receipt thereof by the at least one first arrangement" in part a. of Claim 8 is confusing: no electronic circuit can possibly be faster than light travelling over a few centimetres, as to deliver the signal before the light reaches the first arrangement.
- 7.5 The subject matter of Claim 7 is only defined by the result to be achieved.

## Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO-ISA)

General information	<p>For all international applications filed on or after 01/01/2004 the competent ISA will establish an ISR. It is accompanied by the WO-ISA. Unlike the former written opinion of the IPEA (Rule 66.2 PCT), the WO-ISA is not meant to be responded to, but to be taken into consideration for further procedural steps. This document explains about the possibilities.</p>
Amending claims under Art. 19 PCT	<p>Within 2 months after the date of mailing of the ISR and the WO-ISA the applicant may file amended claims under Art. 19 PCT directly with the International Bureau of WIPO. The PCT reform of 2004 did not change this procedure. For further information please see Rule 46 PCT as well as form PCT/ISA/220 and the corresponding Notes to form PCT/ISA/220.</p>
Filing a demand for international preliminary examination	<p>In principle, the WO-ISA will be considered as the written opinion of the IPEA. This should, in many cases, make it unnecessary to file a demand for international preliminary examination. If the applicant nevertheless wishes to file a demand this must be done before expiry of 3 months after the date of mailing of the ISR/ WO-ISA or 22 months after priority date, whichever expires later (Rule 54bis PCT). Amendments under Art. 34 PCT can be filed with the IPEA as before, normally at the same time as filing the demand (Rule 66.1 (b) PCT).</p> <p>If a demand for international preliminary examination is filed and no comments/amendments have been received the WO-ISA will be transformed by the IPEA into an IPRP (International Preliminary Report on Patentability) which would merely reflect the content of the WO-ISA. The demand can still be withdrawn (Art. 37 PCT).</p>
Filing informal comments	<p>After receipt of the ISR/WO-ISA the applicant may file informal comments on the WO-ISA directly with the International Bureau of WIPO. These will be communicated to the designated Offices together with the IPRP (International Preliminary Report on Patentability) at 30 months from the priority date. Please also refer to the next box.</p>
End of the international phase	<p>At the end of the international phase the International Bureau of WIPO will transform the WO-ISA or, if a demand was filed, the written opinion of the IPEA into the IPRP, which will then be transmitted together with possible informal comments to the designated Offices. The IPRP replaces the former IPER (international preliminary examination report).</p>
Relevant PCT Rules and more information	<p>Rule 43 PCT, Rule 43bis PCT, Rule 44 PCT, Rule 44bis PCT, PCT Newsletter 12/2003, OJ 11/2003, OJ 12/2003</p>